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ABSTRACT

Six papers from the 1990 CAUSE conference's Track VI, Managing Academic Information Systems are presented. Papers discuss issues related to the integration of merging technologies - computing, communications, classrooms - and their effects on the way "academic business" is conducted. Papers and their authors are as follows: "Networked Information Resources and Services in Higher Education" (Paul Peters - Abstract Only); "Access, Equity, and Academic Information - Including People with Disabilities in the Information Infrastructure" (Jay Brill, Jane Berliss, and Danny Hilton-Chalfant); "Managing Academic Information Systems in a Dispersed Environment" (Carol A. Twigg); "Information Access: Computing Services and Libraries - A Joint Offensive Team" (Geraldine MacDonald and Andrew Perry); "From Segregation to Integration: Effective Planning and Implementation of Academic Information Systems" (Don Grinstead, Gerry Bernbom, and Barry Rubin); and "A College Policy on Copyrighted Material" (William J. Moressi, Betty M. Laster, Laurance R. Mitlin, Christopher C. Hodgdon, and Benny G. Coxton). (GLR)

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CAUSE

Challenges and Opportunities of Information Technology in the 90s

Proceedings of the 1990 CAUSE National Conference

TRACK VI

MANAGING ACADEMIC INFORMATION SYSTEMS

November 27 - 30, 1990
Fontainebleau Hilton Resort and Spa
Miami Beach, Florida

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CAUSE 90
MIAMI BEACH
NOVEMBER 27-30, 1990

TRACK VI

MANAGING ACADEMIC INFORMATION SYSTEMS

Coordinators:
Tom Gabriele, Western Michigan University
Steven Gilbert, EDUCOM

Continued and rapid integration of merging technologies—computing, communications, classrooms—are dramatically affecting the way essential instructional services are delivered, and are changing the way "academic business" can be conducted. What will the new classroom include? And how should institutions prepare for this change? Papers in this track discuss issues related to these changes.

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Networked Information Resources and Services: Who Will Benefit, Who Will Make It Happen, and What's All the Fuss About, Anyway?

Abstract of
CAUSE90 Professional Presentation

Paul Peters
Director
Coalition for Networked Information

Many higher education institutions are nearing the completion of two major campus-wide technology development programs with long-term implications: installation of unified communications facilities in the form of advanced networks and modernization of library operations and services through implementation of integrated computer-based information systems. Senior administrators of information technologies and senior administrators of libraries at such institutions are beginning to consider ways to leverage these considerable investments to enhance the scholarship and improve the intellectual productivity of their faculty, student, administrative, and community constituencies. The concept of "networked information resources" has recently captivated the imagination of a wide range of these administrators and their constituents alike

This CAUSE90 presentation elaborated this development and the various types of new partnership relationships that are beginning to emerge as vehicles by which to explore and realize the promise of this concept.

Access, Equity, and Academic Information— Including People with Disabilities in the Information Infrastructure

Jay Brill
Director
Technology Assistance Program
Governors Office for Handicapped Individuals

Jane Berliss
Database Manager
Trace Center
University of Wisconsin/Madison

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ABSTRACT

Over the last 15 years, people with disabilities have become a visible presence in higher education. Enrollment of students with disabilities has increased from under 2 percent in 1975 to approximately 12 percent this year. Increased access is driven by several federal laws including PL94-142 (the Education of All Handicapped Children Act), Section 504 of the Rehabilitation Act, and the recently-passed Americans with Disabilities Act. This paper describes methods of integrating the end user with a disability into the academic information infrastructure.

Access for all – the EASI Way
Campus Computing for People with Disabilities
CAUSE 1990

Computers play a vital role in our nation's economy. Computer users are more competitive in their educational, professional, and personal lives. Adaptive computer technologies are those which enable people with disabilities to conduct activities leading to personal independence and employment. Having said that, today I will discuss with you both the demographics of disability, and current legislation that has created a demand for access to computer technology systems and services for disabled persons and the implications of such legislation for computing in higher education and beyond.

The number of people with disabilities in the general population is increasing. In terms of demographics, we have moved from 36 to 43 million Americans with disabilities over the past decade. Current data indicates that we have close to 5 million children and youth with disabilities in public schools today, and they graduate into postsecondary education at the rate of 180,000 each year! The percentage of college freshmen with disabilities has tripled in the past seven years . Current estimates place the proportion of students with disabilities on campus at over ten percent of enrollment. With total enrollment currently at 12.8 million — we are looking at a over a million students with disabilities! This increase in enrollment for students with disabilities is expected to continue as we improve early diagnosis of

disabilities and as medical and technological advances are integrated into everyday living.

Of the 43 million Americans with disabilities, over 50% of are of working age, and 5 of 6 of Americans with disabilities acquired them during the course of their life. Of the 22 and a half million Americans with disabilities over 75% are unemployed! Can we afford to waste this much human potential?

Workforce 2000, the Hudson Institute report on the future of the American workforce, points out the need for ongoing retraining of workers to keep the aging American workforce competitive

And, as our workforce ages, with increasing numbers of workers with disabilities entering *or remaining in* the workforce, the need and expectation of access to the electronic highways of the information economy will increase.

Congress recognized that without access to technology and electronic information, federal workers with disabilities would be lost from the federal workplace, and designed Section 508 of the Rehabilitation Act of 1973 (1986 Amendments) *"...so that handicapped individuals may use electronic office equipment with or without special peripherals."* After October 1, 1988 computers purchased or leased by the federal government must be accessible to end users *"with or without disabilities."* Section 508 can be

interpreted as federal recognition of the importance of computers in the workplace, comparable to the federal impetus provided by the Architectural Barriers Act of 1968, which set physical design criteria for alteration needed to accommodate persons with physical disabilities in the federal workplace.

The Americans with Disabilities Act (ADA) provides full civil rights for people with disabilities. Provisions of the ADA will impact on higher education and the campus computing marketplace. The following provisions of the ADA, exerpted from U.S.Department of Justice, Office for Civil Rights may raise questions on any campus.

General

Public accommodations such as restaurants, hotels, theaters, doctors' offices, pharmacies, retail stores, museums, libraries, parks, private schools, and day care centers, may not discriminate on the basis of disability. Private clubs and religious organizations are exempt.

Reasonable changes in policies, practices, and procedures must be made to avoid discrimination.

Auxiliary Aids

Auxiliary aids and services must be provided to individuals with vision or hearing impairments or other individuals with disabilities, unless an undue burden would result.

Physical Barriers

Physical barriers in existing facilities must be removed, if removal is readily achievable. If not, alternative methods of providing the services must be offered, if they are readily achievable.

All new construction in public accommodations, as well as in "commercial facilities" such as offlce buildings, must be accessible. Elevators are generally not required in buildings under three stories or with fewer than 3,000 square feet per floor, unless the buil :ling is a shopping center, mall, or a professional office of a health care provider.

Alterations must be accessible. When alterations to primary function areas are made, an accessible path of travel to the altereli area (and the bathrooms, telephones, and drinking fountains serving that area) must be provided to the extent that the added accessibility costs are not disproportionate to the overall cost of the alterations. Elevators are required as described above.

Employment

Employers may not discriminate against an individual with a disability in hiring or promotion if the person is otherwise qualified for the job. .Employers can ask about one's ability to perform a job, but cannot inquire if someone has a disability or subject a person to tests that tend to screen out people with disabilities. .~ Employers will need to provide "reasonable accommodation" to individuals with disabilities. This includes steps such as job restructuring and modification of equipment. .~ Employers do not need to provide accommodations that impose an "undue hardship" on business operations.

•Timelines to Comply:

All employers with 25 or more employees must comply, effective July 26,1992.
All employers with 15-24 employees must comply, effective July 26,1994.

Public Transit

New public transit buses ordered after August 26,1990, must be accessible to individuals with disabilities. . Transit authorities must provide comparable paratransit or other special transportation services to individuals with disabilities who cannot use fixed route bus services, unless an undue burden would result. . Existing rail systems must have one accessible car per train by July 26,1995. New rail cars ordered after August 26,1990, must be accessible. .New bus and train stations must be accessible. .Key stations in rapid, light, and commuter rail systems must be made accessible by July 26,1993, with extensions up to 20 years for commuter rail (30 years for rapid and light rail). All existing Amtrak stations must be accessible by July 26, 2010.

Telecommunications

Companies offering telephone service to the general public must offer telephone relay services to individuals who use unications devices for the deaf (TDD's) or similar devices.

The ADA is historically tied to both the Civil Rights Act of 1964 and to Title V (civil rights and non-discrimination) of the Rehabilitation Act of 1973.

Section 504 of the Rehabilitation Act mandates non-discrimination on the basis of handicap in programs receiving or benefiting from federal financial aid. Section 504's implementation

on campus over the past 13 years may be seen as the preface to the implementation of ADAin the community at large

We are now in the thirteenth year since the Regulations implementing Section 504 were implemented and the fifteenth year since the Education of All Handicapped Children Act (PL 94-124) opened classrooms to children with disabilities.

Today, students with disabilities have access to an expanded universe of educational options. In the early days student access,was concerned with physical access to buildings for students with limited mobility. a decade and more later, issues of physical access have largely been resolved, and questions revolve around full participation by students with disabilities in the full range and scope of academic life and their transition to the workplace.

The recently passed Technology-Related Assistance for Individuals with Disabilities Act of 1988 PL 100-407, is mandated to create a series of "statewide...age inclusive.. assitive technology services..." will create markets for accessible assitive technologies in each state. Maryland, as one of the first nine states funded by the department of education, has been joined by an additional 13 states. By 1995, Technology-Related Assistance Programs will be operating in all 50 states. All "Tech Act" states are funded with inclusion of a "508 compliance" assurance. This assurance appears to indicate that

Section 508 may also come to serve as a checklist for non-discriminatory computer access in programs which, while covered under Section 504, are not now covered directly by 508 but are covered under Section 508, and are expectd to be covered under ADA regulations.

With the passage of ADA, institutions may find themselves retracing the early days of Section 504 compliance. One of the most instructional of the early accessibility issues that arose was that of access to the campus library, for without access to the full range and scope of library materials and services, and an understanding of library use, students with disabilities were placed at a severe competitive disadvantage.

Many college courses include computer use as part of normal classwork. On many campuses, instructors in humanities and the sciences *assume all students will have computer access as readily as access to the library.* Employers also are beginning to assume computing skills, and ready access to computers as part of those basic skills required of new employees. For institutions to meet the increased computing needs of students with disabilities, while on campus and in preperation for employment, additional adaptations to existing campus computer facilities are needed, including general use PC labs, terminal rooms and computerized library catalogs. Campus computer centers or IRM administrators

will need specialized resources to meet these needs. Many colleges and universities, guided by the American Council on Education, Project EASI and the Association on Handicapped Student Service Programs in Postsecondary Education use Section 508 as a guideline for assuring 504 compliance on individual campuses. The University of Missouri-Columbia, and UCLA are two outstanding examples of integrating computer access in mainstream computing. The High-Tech Centers of the California Community College system are a resource for two year programs.

The ongoing systems change in access to technology, driven by sections 504 and 508, now fueled by the advent of ADA presents the campus computing community with the opportunity to include all potential users. Project EASI and others are ready to help you meet this challenge.

Managing Academic Information Systems in a Dispersed Environment

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ABSTRACT

SUNY/Empire State College is not unique in recognizing that the rapid integration of merging technologies will dramatically affect the delivery of essential academic services. But ESC is unique in demonstrating that it is not necessary to have a campus in order to have a college. For twenty years, we have enabled working adults to complete a college degree by linking them to faculty, libraries, laboratories, internships and other learning resources without asking them to leave their homes or their places of employment. ESC is the largest and most successful free-standing non-traditional college for adults in the U.S., a "university without walls" enrolling more than 10,000 students throughout New York State each year. Having developed institutional structures and teaching methodologies that converge with the technological developments of the last decade, ESC's approach to the integration of information technology in higher education provides a microcosm of how "academic business" may be conducted in the twenty-first century. This presentation will describe how ESC manages academic information systems in a dispersed, decentralized environment.

SUNY/Empire State College is a unique and exciting institution--a "university without walls" enrolling more than 10,000 students throughout New York State each year. Empire State is the largest and most successful free-standing non-traditional college for adults in the United States. Founded in 1971 to serve students who need an alternative to classroom attendance and residential life found at traditional colleges and universities, ESC has developed institutional structures and teaching methodologies that converge with the technological developments of the last decade. Internationally recognized as a leader in distance learning, Empire State's approach to the integration of information technology in higher education provides a microcosm of how "academic business" may be conducted in the twenty-first century.

Like many corporations, ESC has a dispersed organizational structure. Empire State is itself a network of a certain kind--a network connecting people to people and people to learning resources--that lends itself to the deployment of computer intelligence to enhance its instructional capabilities. For twenty years, we have enabled working adults to complete a college degree by linking them to faculty, libraries, laboratories, internships and other learning resources without asking them to leave their homes or their places of employment. Empire State College has demonstrated that it is not necessary to have a campus in order to have a college, that a high quality education can be provided by networking people to people and people to resources.

Institutional Background

Empire State was created by the State University of New York to develop alternative approaches to higher education that would build on and extend the existing strengths and resources of the University system. As a consequence of this distinctive mission, the College has created high quality academic programs that increase access for students unable or unwilling to study on campus; it has responded to individual student purposes as well as to emerging social needs; and it has done so at reasonable cost. ESC has consistently been on the leading edge of innovative program development, pioneering work in mentoring, the use of learning contracts, the evaluation of experiential learning, and distance learning.

By and large, the students who seek such alternatives are adults; consequently, the average age of Empire State students is 37. 10,000 students study at ESC in any one year. 87% have full-time jobs, and a large majority are married. 16,000 students have completed degrees during the last 19 years. Already employed in business, industry, government and labor when they come to us, most ESC students remain in New York State after graduation. More than half of all ESC graduates go on to graduate school.

Unique Features of ESC's Program

Many adults who would like to attend college and whose careers would benefit from college participation do not do so because the "balancing act" consisting of job, home and community responsibilities is simply too difficult. At ESC, students work one-on-one with individual faculty mentors through guided independent study and flexibly scheduled meetings. ESC provides instruction in this way in order to minimize conflict with students' employment and family responsibilities.

Rather than bring the student to a single location, Empire State instead brings the College to the student. The College has established a network of learning centers in more than 40 locations across the State of New York. Students who choose not to travel to a campus to attend classes now have the opportunity to achieve an associate, a baccalaureate or a master's degree within or close to their communities. Eleven academic and professional areas are offered including business, human services, science and technology, and the full range of the liberal arts.

A key feature of ESC's unique mission is to utilize existing resources rather than duplicate them. ESC faculty identify which studies or courses students need in order to complete a degree and link them with instructional resources that may be found anywhere. For example, ESC does not have its own library but rather directs students to the libraries of the State University, private institutions and the public library systems of the State.

By building an academic program around what is available, the College is rarely faced with accumulating obsolete equipment or outdated

materials; its strategy is to be constantly mindful of the existence and source of the most up-to-date resources. Such a strategy is inherently cost effective since it minimizes the need to develop large instructional budgets--e.g., library holdings, laboratories. Empire State's strength has been to identify, access and utilize a vast array of learning resources, not to create them. The fact that ESC is not limited by its own resources makes it a dynamic institution that can respond quickly to emerging social needs.

ESC's Computing Environment

Empire State College has developed its academic computing program in response to this distinctive mission. In 1980, the College began to purchase microcomputers as a cost effective way of developing academic computing at its 40 locations. Since then, we have seen the steady growth of microcomputer use by faculty and students. The College currently owns about 400 microcomputers. Almost all full-time faculty have computers on their desks; students access computing in resource rooms at our regional sites and from their homes and offices.

In 1986, the College installed a VAX 11/750 to serve as a communications link for faculty and students via dial-up access. Current applications include file transfer, electronic mail, bulletin boards and computer conferencing.

Empire State's administrative computing system, housed on the State University's central IBM 3070 in Albany, is linked via terminals and leased lines to our major regional sites. Prior to 1989, ESC's computing support structure consisted of a relatively large data processing department (7.0 positions) to support administrative computing and a small (1.0 position) academic computing/office automation staff to support faculty and students as well as all office automation applications. The data processing department reported to the Vice President for Administration; the microcomputer support person reported to me in my role as Assistant Vice President for Academic Affairs.

Three years ago, the College President reassigned the responsibility for administrative computing and its support staff to me as one means of correcting the balance between academic and administrative computing. A major goal of mine has been to reorient and restructure our computing support staff to create an integrated support structure that more accurately reflects the College's needs.

Impact of Networking Technologies

At ESC, we believe that integrating networking technologies into our academic program is essential to improving access to and the quality of the collegiate experience for placebound adult students. Modern telecommunications and information technologies are freeing both students and faculty from the confines of physical facilities, allowing them to access learning resources from great distances as if they were in the same building. A key feature of these media is that they may be used asynchronously--that is, they allow people to interact with one another at a time and place most convenient to them.

Among institutions of higher education, ESC is particularly well suited to employ networking applications for several reasons:

- The heart of ESC's institutional philosophy is that education need not be confined to a particular physical location.
- ESC has pioneered in developing opportunities for individualized learning through programs not bound to specific campus locations.
- ESC has fashioned a delivery mechanism allowing students who need flexibility of schedule and location to obtain a high quality education.
- ESC's experience in working within an innovative framework with non-traditional clientele has placed the College in an ideal position to advance to the next level of delivery technology.

Thus, computer networking is a natural extension of ESC's mission. ESC has already broken from the physical constraints of campus facilities; now the technology exists to make off-campus learning more productive and more effective than heretofore possible. Networking technologies complement and extend the unique instructional strategy of the College; their integration provides a model for the organization of collegiate learning in the future.

A recent (1988) ESC study of student interest in educational technologies revealed broad access to the requisite hardware. In response to a question asking if they owned or had access to equipment that they could use for ESC study, 94% of the students replied yes for audio cassette players, 90% for video cassette recorders, and 61% for microcomputers. Access to modems, at 17%, was the only potential concern.

Since that survey, ESC's regional sites have been equipped with computers and modems. In addition, most public libraries have computers for public use, some with modems. ESC students may also, with prior arrangement, use computer resources at most of the 64 colleges in the statewide system.

We are also convinced that the relative lack of modems presents no real barrier. Over twice the number of students who said they had a modem indicated they would take a course, if appropriate to their studies or interests, that required a modem. This finding argues for the position that students will secure modems, as they secure texts, when it is in their educational interest to do so. To encourage student involvement in computer-mediated communication, the College will initiate a modem loan program in early 1991. We project that in three years 80-90% of our students will have access to a computer with modem and that access can be secured for any other student who needs a computer for ESC study.

The ESC/SUNY Center for Learning and Technology

In response to institutional readiness on the one hand and student interest and demand on the other, the College recently decided to create the ESC/SUNY Center for Learning and Technology (CLT). It is important to note the word "and" in CLT's title because the Center is not intended to be a learning technology unit (a computer lab, for example, or television studio). Rather, its purpose is to serve as a locus of activity to support the development and use of learning alternatives for students and to support faculty activities involving the application of technologies.

To emphasize its academic perspective, CLT is part of the Office of the Vice President for Academic Affairs and is subject to oversight by a faculty advisory committee. CLT is supported by a combination of internal reallocation of College resources and seed money from a universitywide venture fund established by SUNY Chancellor Bruce Johnstone. Its establishment will accelerate the College's development of technological applications.

In its first year, CLT is exploring what appear to be the following benefits of using telecommunications technology:

- Increased peer interaction among students via computer networking.

ESC has always recognized that what is gained in the flexibility of independent study may mean a loss in the support and stimulation that come from peer interaction. Asynchronous technologies provide the means to put students in contact with one another--enabling them to test their ideas in a scholarly community--without requiring travel or scheduling.

- Increased opportunity for student-faculty interaction.

Although ESC has brought the campus to the student, its program has been based primarily on face-to-face meetings at regional sites. Consequently, a student in Plattsburgh wishing to study with an ESC faculty expert in Rochester, for example, could not do so in the past. Thus, students had access to only a fraction of ESC's statewide faculty.

Networking allows students to communicate with faculty across the state. Faculty who might otherwise be unavailable because of time or distance constraints can now lead remote classes or independent studies. The best person for the instructional task can be chosen regardless of location, increasing both educational quality and productivity. This networking model allows cost effective access to a wide array of faculty resources. Using national networks such as BITNET, students and faculty will also have access to a national and international audience of academics.

Computer messaging allows increased academic support for the independent study mode of instruction. Personal contact between mentor and student can be expanded. Faculty create "electronic office

hours." Students transmit work and ask questions of faculty, asynchronously and on-line via split-screen commentary. Previous experiments with computer-mediated seminars convince us that many of the social experiences of the classroom can be achieved electronically. CLT's projects, therefore, will include a significant level of computer-mediated communication.

- Increased student and faculty access to non-classroom learning resources, particularly libraries and data bases.

As noted above, an important part of Empire State's mission has been to utilize existing resources rather than duplicate them. Telecommunications technology enhances one's ability to access learning resources such as libraries and data bases. In addition, the technology itself can be exploited to support the users of these and other mediated resources.

Staffing of the Center for Learning and Technology

The staff of the Center for Learning and Technology consists of four professionals who report to me. Their relationship to the Office of Computer Services (administrative data processing) is a parallel and cooperative one. My tasks are to identify priorities (planning) and allocate resources (budget), appoint and evaluate staff, manage cooperation among CLT staff and with Computer Services staff, and to focus CLT's activities on achieving our strategic goals.

- User Support Coordinator (USC)

Providing technical support to all College microcomputer users, with special responsibility for faculty, is the central responsibility of the User Support Coordinator. A former programmer/analyst in ESC's Office of Computer Services, the USC coordinates purchase, installation and maintenance of microcomputer products in both their standalone and telecommunications capacities. The USC advises faculty about existing system capabilities, the feasibility of system modifications and the potential for adapting particular media and hardware to meet learning objectives. He "customizes" PC and VAX applications for use by ESC faculty, staff and students to improve their accessibility and effectiveness.

- Training Coordinator (TC)

ESC shares with all colleges and universities the need for a substantial training program to develop faculty and staff skills in using computing and telecommunications technology. While many of our faculty are able to see the potential for integrating these technologies into the academic program, they have been stymied in doing so because they lack basic skills in how to use them.

Based on a collegewide needs assessment conducted in relation to CLT's strategic goals, a systematic training program to move our efforts forward is being developed by the Training Coordinator. This program includes training in basic telecommunications and computer skills such as word processing, file transfer, use of electronic mail, electronic bulletin boards and computer conferencing; use of computers in applications particular to the ESC academic program (e.g., learning contracts, degree programs and individual learning resource libraries); and use of telecommunications technology to access libraries and external data bases. The TC also prepares user support materials, including system documentation, guides and manuals.

- Learning Resources Coordinator (LRC)

The Learning Resources Coordinator provides ongoing advice, consultation and support to College faculty regarding the acquisition, development and utilization of video-based and computer-assisted instructional materials. To support these efforts, she is collecting pertinent journals, books, manuals and trade publications, and she is developing a data base of software and other mediated instructional resources owned by the College. The LRC also identifies and secures access to the electronic resources of external institutions and networks. In CLT's first year, the LRC's primary task is to develop a collegewide electronic library access program. Information about all of these resources is provided to faculty and students through CSOURCES, a VAX-based bulletin board.

- Coordinator of Faculty Development

An ESC faculty member is spending a year on reassignment to CLT to lead our faculty development efforts. This leadership is expressed in several ways. First, he is coordinating a variety of individual faculty projects utilizing technology in the academic program. These projects, described below, are the central focus of his work. Second, he is developing, implementing and evaluating a model multi-media learning experience integrating computer conferencing, video and distance study--i.e., he is leading by example. Third, he is committed to collegewide communication, an essential ingredient to the success of CLT. This communication is two-way: he serves as a "voice of the faculty" by brokering technical support and resource needs to CLT staff, and he informs the general college community of the progress of CLT's activities through internal publications and communications systems. Finally, he is seeking external funding to develop, implement and maintain technology mediated learning at ESC. For example, he and I collaborated in developing an Annenberg/CPB grant and, while the grant was not funded, ESC was a finalist and will participate as an Associate in the New Pathways to a Degree Program.

CLT's Strategy: Focus on Faculty

The central strategy of CLT is to focus its activities on faculty development. Our guiding themes are "Planning, Service and Visibility." We have created a monthly newsletter which we distribute to all ESC faculty and staff, students who elect to receive it, and persons outside of the College who wish to be kept informed of our activities.

The CLT Venture Fund

CLT has established its own Venture Fund to support faculty who wish to develop applications of instructional technology. Providing modest, but largely unrestricted, grants to individual faculty to acquire and test media (primarily software and videos) for use as learning resources, the Venture Fund is currently supporting 13 projects. Underway are experiments in remotely accessed computer assisted instruction; mathematical toolbox software in advanced applied mathematics; studies in finance using videotapes; computer mediated laboratory simulations in biology; and, teaching writing at a distance using terminal capture software.

Response to this program has been very positive: in its first year, 10 percent of the full-time faculty applied for funding. Grantees are obligated to prepare written evaluations of the media and analyses of potential application across the College. CLT's Venture Fund responds to individual faculty interests while benefiting the whole College community with their findings.

The Technology Mediated Learning Project (TMLP)

The Technology Mediated Learning Project (TMLP) is a faculty-centered initiative intended to bring together the more technologically sophisticated faculty to develop collegewide, collaborative faculty demonstration projects. As the technology competency level of the general faculty increases, so will the numbers who will want to participate in this faculty development effort. Similarly, as student competency grows, so will the demand for technology mediated learning opportunities. If TMLP is successful, it will provide a model of the way to support the on-going academic program development and implementation efforts of the faculty.

An important outcome of TMLP will be the further definition of appropriate technological applications that are relevant to ESC's mission, students and curriculum, that are cost effective, and that improve the quality of educational practice at ESC.

Focussing on faculty development, TMLP's goals are to:

- promote faculty understanding of technologies and their application to learning;
- assist faculty to develop and implement technology mediated learning experiences;
- provide a forum in which academic, pedagogical and technical knowledge and experience can join to provide resources for developers;
- identify gaps in resources, experience and knowledge;
- examine, test and implement alternative pedagogies required by, supportive of, and/or associated with technology mediation;

- evaluate both the development and implementation of applications for students and faculty;
- demonstrate successful experiences; and,
- increase knowledge and improve practice in adult and technology mediated learning generally through contributions to the literatures of these fields.

The Hyper-Seminar

Two projects illustrate the type of activities being undertaken by TMLP participants. Both are what we call "hyper-seminars." They are intended to bring together, electronically, students and faculty throughout the College who are engaged in similar studies or who share academic interests. They also make available to students and faculty "guest speakers," outside experts, without regard to place or time. Each hyper-seminar includes a "snack bar" for informal discussion, "office hours" in which students can address questions to specific faculty, a "library" for sharing comments and ideas on books and other resources, and a means for students to "talk" privately.

The first hyper-seminar has been designed around the PBS telecourse *Discovering Psychology*. Students across the State are enrolled in an introductory psychology study in a variety of ways--through mentored independent study, through study groups, through a distance learning course--using print and video resources. With the video programs as a focus for discussion, participating students and faculty are brought together electronically in an electronic seminar much as they would do physically on a campus.

The second hyper-seminar, an advanced level study in economic policy, is scheduled for implementation in early 1991. Most ESC students pursue their degree programs through independent studies which they design and complete with an individual faculty member. Students participating in the hyper-seminar will continue to work independently, but they will also be engaged in a seminar, as well as in informal contact, with students across the College who are studying economic policy. One faculty member will lead the seminar, and experts from within and outside of the College will be brought in to contribute to specific topical discussions.

Other TMLP projects include a distance learning course, "The Constitution and Public Policy," a multi-media learning experience that integrates computer conferencing and the Annenberg series *The Constitution: That Delicate Balance*; an English composition course called "Writing for the 21st Century" that uses computer conferencing to incorporate collaborative pedagogy in the writing process; an electronic seminar on artificial intelligence; and an interdisciplinary, computer-based course, "The History of Business," team taught by two faculty from history and business.

TMLP's Relationship to CLT

While CLT is responsible for collegewide technology support, support for TMLP activities is a priority. CLT staff assist TMLP participants in areas such as resource identification and acquisition, extramural systems interfacing, application design and analysis, instructional design, and applications training.

The relationships between CLT staff and TMLP participants mirror and anticipate the relationship between CLT and the College faculty at large. TMLP provides an intensive and focused opportunity for CLT staff to understand faculty needs and visions versus ESC's resource and systems capacities. At the same time, TMLP provides a similar opportunity for faculty to become sensitive to the uses and misuses of the CLT resource. The early, close working relationship of CLT and TMLP will serve to define the future relationship between CLT and the faculty as a whole.

Accessing Libraries Electronically

CLT is developing a library access program to provide the capability for all ESC faculty and students to access all on-line public access catalogues in New York State. Adult students find it both difficult and time-consuming to travel to libraries searching for reference materials. Establishing electronic access to libraries will remove the physical barriers to library access, thus increasing library usage.

In addition, we plan to enable faculty and students to incorporate use of encyclopedic data bases into their programs of study. Databases such as DIALOG and BRS offer computer searches, bibliographic citations and abstracts of the material. Electronic access to both kinds of bibliographic materials will increase the quantity of materials available to off-campus students as well as enrich the quality of their studies.

Creating a Demonstration LAN with Help from AT&T

ESC has received funding from AT&T's University Equipment Donation Program to establish a local area network at our Regional Center in Rochester. This is the first phase of a development plan leading to the creation of local area networks in our largest Regional Centers. The Rochester LAN will serve as a demonstration site for the rest of the ESC community and provide us with the experience needed to implement the full plan.

The LAN consists of a STARLAN network connecting faculty PCs for file sharing, database access, printer and disk sharing; synchronous and asynchronous gateways to ESC's VAX and IBM 3070 applications; local electronic mail via AT&T Mail; remote PC access support to allow distant faculty and students to function as if physically connected to the LAN; FAX servers with scanners and printers to provide FAX communications to and from LAN clients and remote locations; and X.25 router hardware and software for bridging multiple Regional Center LAN's so that they appear as one large LAN.

ESC: A Model Institution for the Information Age

While many of our applications of computing and telecommunications technologies are in their early stages, it is clear that the College is gaining valuable experience in using them to enhance its academic program. What we have achieved thus far has been possible primarily because our existing structure and pedagogy has made the adaptation of these technologies a natural extension of our academic program. We believe that ESC has the capability of becoming a leading innovator in the use of instructional technology and that our experiences can be shared with and adapted by other colleges and universities as well as by any organization that operates in a dispersed environment.

It has become commonplace to observe that we live in an information age. The volume of available information, in a growing array of formats, increases exponentially each year. Scientific and technical information alone doubles every 20 months whereas 30 years ago it doubled every five years. No single person or group of individuals is capable of assimilating all the available information or of keeping abreast of new information as it is generated. Similarly, no university and no library can hope to meet the instructional and research needs of its students and faculty by itself. Cooperation and sharing is required for campuses committed to a "rich information infrastructure" to support both student and faculty needs. New models for delivering higher education are needed to respond to these significant societal changes.

Empire State College has demonstrated that it is not necessary to have a campus in order to have a college, that a high quality education can be provided by networking people to people and people to resources. We know that the integration of computer networking will exponentially increase the effectiveness of our distance learning methodology. We are committed to meeting the challenges of the information age, and we are confident that we will succeed.

[I wish to acknowledge the staff of the ESC/SUNY Center for Learning and Technology for their contributions: Bob Perilli, User Support Coordinator; Larry Greenberg, Training Coordinator; Lora Montague, Learning Resources Coordinator; and, especially, Lowell Roberts, a mentor in ESC's Center for Distance Learning who leads our faculty development efforts. This paper is a product of our collaboration.]

Information Access
Computing Services and Libraries: A Joint Offensive Team

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Abstract: Access to scholarly information, now available in a variety of mediums, is essential to the evolving instructional and research efforts at universities. A joint approach to these issues by Computing Services and by the Libraries at the State University of New York at Binghamton has provided new avenues of access to data resources and bibliographic materials.

This paper describes several areas of cooperation:

1. Early 1980's access to the card catalog and circulation information through the campus network.
2. Present data access to resources such as Compustat, ICPSR, and CRSP funded and managed jointly.
3. Present access to regional and national library resources from the campus network over the national research networks.
4. Cooperative project to link catalogs with the three SUNY University Centers via NYSERNet.

A new general campus information and access menu has been implemented at Binghamton to present the library public catalog, to allow access to commercial databases, and to provide access to other University information. Studies are now underway to provide access to CD-ROM based materials via the campus network, to provide automated access to services such as inter-library loan, and to explore the impact of digital imaging technologies.

I. A Historical Look

The library was an early participant in the emerging computing technologies on campus with the introduction of machine-readable cataloging records developed in the mid 1960's. As part of this evolution SUNY-Binghamton joined OCLC and subsequently the Research Libraries Group to allow cooperative cataloging and inter-library loan using private vendor-specific networks. Later the advent of Dialog, BRS, and STN led the Library to begin to offer online searching services.

In addition to these original systems (which were largely batch computing applications providing circulation listings and shelf lists) one of the earliest campus networks existed between the library and the computer center. It supported a punched card circulation system. Librarians inserted a pre-punched ID card into a system reader that signaled a punch card device in the computer center which produced a card image record of the transaction. These cards were run nightly to provide circulation listings and maintain a simple database of holdings. This primitive network taught us several important principles about real-time services and paper backup systems.

As the costs of computing hardware began to drop and other costs such as library support staff and library acquisitions began to rise, a turnkey minicomputer system was acquired to automate some library functions. At Binghamton a GEAC 8000 was installed that provided an online catalog (OPAC) and circulation control. Initially this system was a satisfactory cost containment solution but within four years its resources were seriously strained and future growth was limited.

II. Current Status

To expand library resources during the late 1980's Binghamton decided to move library automation functions to the university's large IBM 3090 mainframe. Before migrating to this mainframe several minicomputer options were considered. Dedicated minicomputers could not meet the performance and data storage requirements identified at Binghamton. It was essential to select a system with sufficient capacity to fully integrate library functions including circulation, catalog access and acquisitions as well as offer common software for clients to access multiple information resources such as commercial databases.

The major issues involved in the mini to mainframe computer transition included:

- RFP and contract
- Funding and support
- Planning
- Implementation

RFP's and contracts for Library systems can be multi-year projects. At Binghamton we were fortunate to participate in a multi-campus RFP with SUNY-Stony Brook and SUNY-Buffalo to acquire a mainframe-based software which resulted in the NOTIS product. The prices obtained in the three-campus contract saved the campuses and the State a considerable

amount of money. The potential savings provided the impetus for the three campuses' libraries, computing services and administrations to work together in acquiring funding and support for the next generation system. It also provided a framework for future joint development projects.

Once the contract was signed the implementation project took almost 13 months to complete (April 29, 1988-May 22, 1989). Several significant tasks involved the re-wiring of the Libraries, conversion of bibliographic, item, and patron data and staff training. A key to the project's success was the hiring of a permanent systems librarian to serve as project manager and the assignment of an assistant director from Administrative Computing Services to the implementation project.

There has been general agreement at Binghamton about the importance of Administrative Computing to the success of the project. Libraries are usually considered academic agencies but have much more in common with administrative agencies. Functions such as inventory control, personnel and user files, overdue notification and billing are applications where administrative computing has the experience and the natural organizational responsibility to integrate library requirements with other institutional databases. There was a wide level of Library staff participation in the implementation of the new system. Staff contacts between Library and Computing Services helped make the transition a positive experience for both parties.

III. Linked Resource Databases

Providing online access to the Library's book collection was only the first step. Although a large portion of the information needed by students and faculty are contained in journals, these were typically indexed only in print media or on expensive CD-ROM, or connect-time oriented systems such as Dialog. As a result one area for library automation often identified by users was online journal indexing.

CRSP and COMPUSTAT datasets were early model of information resources purchased as part of library holdings, with funding support from the Provost. Usage involved support from both Libraries and Computing Services.

In late 1989 a Library task force, with the aid of Computing Services, undertook a study of database systems that would complement the existing online catalog. This culminated in the selection of the NOTIS multi-database software and the H.W.Wilson Indexes as the first online database.

During the implementation stage of the multi-database software, product site license restrictions necessitated the development of a front end to the Library system that would limit database access to members of the SUNY-Binghamton University community. Today this front end software supplies nonport-specific access to university members; book and journal citations are now retrievable from all areas of the campus. Additionally, this in-house software also provides Binghamton with a solution to controlling keyword/boolean searching;

CPU resources required for these searches are protected by limiting the number of simultaneous searches.

IV. The Next Frontier

A. Linked information systems over national networks
B. Workstations, multiple sessions, and X-windows

Libraries today are faced with increasing pressures of cost and space as the amount of published information multiplies. To alleviate these pressures librarians are beginning to look to electronic methods of expanding access beyond their individual campuses to national electronic information networks. They are relying on campus computing technology to maximize access and minimize costs. The PACLink project now underway at three SUNY campuses and eight Indiana campuses will link end users to multi-campus library resources. The use of the Z39.50 protocol which facilitates information retrieval will ultimately allow wide connectivity by the method of separating the search query from the search engine software. SUNY librarians see PACLink as a necessary step towards greater collection sharing.

Library systems are large "information servers". For librarians at Binghamton there are already several servers available both on and off campus. To facilitate the use of these systems reference librarians must have appropriate access along with library patrons. Currently a study is underway addressing a design for a "Librarian's Workbench" (see Fig. 1). Using X-windows and an appropriate workstation a reference librarian will open several simultaneous windows when assisting a library patron. Multiple catalogs on several campuses can be searched in separate windows and Inter-Library Loan (ILL) forms can be completed in another window. The application can even include scanning the patrons library access bar code. Other librarians will use similar workbench screens to process acquisitions, handle fines or read their own electronic mail. Placing new tools on the librarian's desk will necessitate an update to the wiring plan in the library. In addition, support for foreign language character sets, and various analysis tools such as LOTUS 123 and SAS will still be required.

V. Not Just the Online Catalog

Establishing the online catalog and its associated facilities is only the first step in the joint efforts of libraries and computing services. Several other projects requiring cooperation include:

A. microcomputer facilities in libraries
B. CD-ROM and LAN development
C. multi-media applications
D. Telefacsimile, OCR, and Image technologies
E. University ID systems
F. Database of software titles
G. Full text applications

Librarian's Workbench

X-WINDOWS

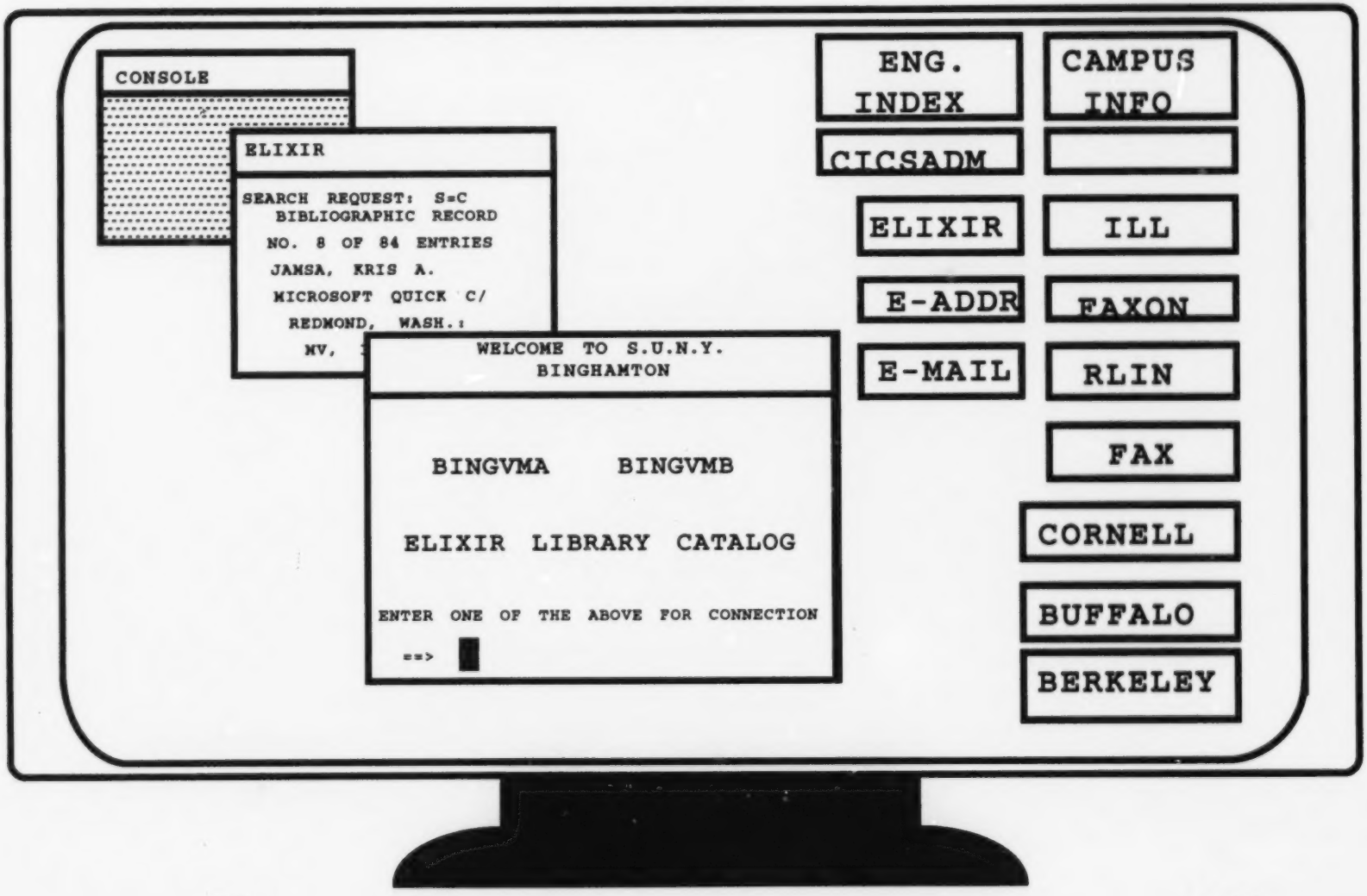


Fig. 1

VI. General Conclusions

1. The library will become the largest user of computing resources on campus. Binghamton's experience has shown that since the move to the mainframe searching has increased 50% in one year. On a moderately busy day our library's usage tops 52,000 CICS transactions. October 1990 statistics show almost 1.5 million CICS transactions for the library system (see Fig. 2).

2. The library will consume all the disk storage money can buy. The wealth of available databases creates an endless appetite for mainframe storage. A joint plan between computing and libraries will help insure that disk space is available when new information resources are purchased.

3. Once the library is on the campus network and the Internet, many new users from off campus will use your system, particularly if it has superior performance or enhanced capabilities. Oddly enough these users often search the title on remote automated systems in order to find the book in their own libraries.

4. Things Librarians Overlook

- performance factors
- backups
- wiring
- concept of band width
- maintenance and support

Librarians need the help of computing professionals when evaluating new systems. A Librarian's typical response to systems planning is to appoint committees that focus on system features. The importance of load testing and performance factors are often overlooked. Confusion between the capabilities of mainframes, minicomputers, and microcomputers is also common. A good joint offense will result in improved resources for the entire university.

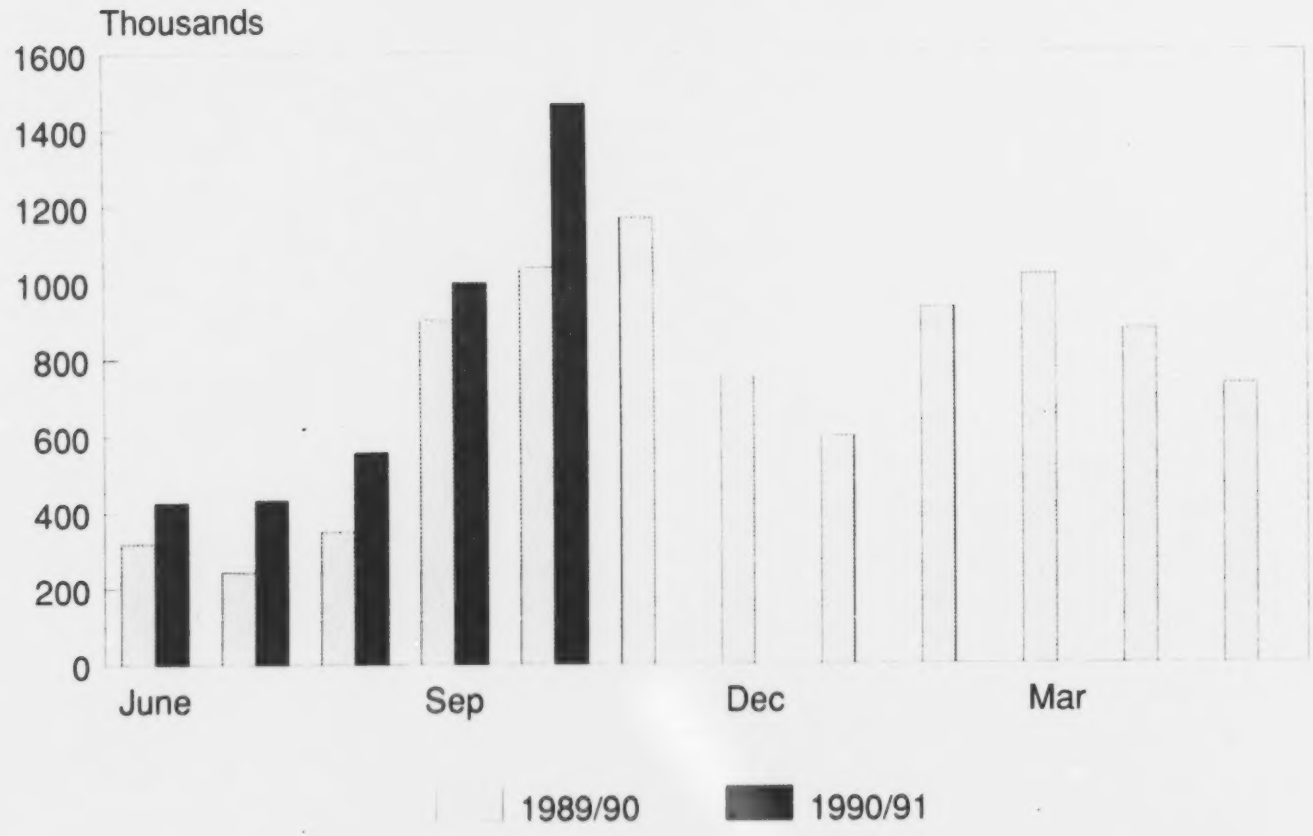
5. The organization of the University Computing Services is critical to the success of library automation.

Organizational "Pluses" from the Library Perspective:

- Library is supported by Administrative Computing (although often considered an academic department, the Library has more in common with administrative functions).

- Academic computing/administrative computing are departments within the same Computing Services organization.

SUNY Binghamton Libraries
Monthly CICS Transactions



CAUSE90

Fig. 2

- Computing Services and the Library report to different campus Vice Presidents. When the Library and Computing Services get support from two VP's, things happen!

Library computing applications on campus are extremely relevant to new directions in today's computing field. Concepts such as "knowledge navigators" are on their way to becoming reality. The theme of "information at your fingertips" and the facility to retrieve and organize information is where much development is currently occurring. Enhanced library support as a campus priority will insure an improved educational experience for students and greater productivity for researchers.

From Segregation to Integration: Effective Planning and Implementation of Academic Information Systems

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The isolation of administrative information systems from academic systems has segregated essential institutional data which could be used to further the academic mission of the university or college. Through integration of systems across diverse technology platforms and opening access to institutional data, Indiana University has begun to expand the concept of Academic Information Systems. This paper describes the evolution of Academic Information Systems and the forces behind that evolution, portrays the Academic Information Systems planning and implementation process currently underway at Indiana, and makes the results of this planning generalizable to any university or college.

Academic Information Systems: What Are They?

There are many kinds of resources which are of vital importance to support the academic mission of the college or university. Certainly financial resources, human resources and facilities are critical and limited, and in most cases these resources are shared between various departments and concerns to provide optimal effectiveness.

Libraries are being told to increase inter-library loan activities rather than increase their acquisitions budgets. Academic departments are being asked to scrutinize their classroom activities and take on more with less available resources. Administrative departments are being closely scrutinized to identify areas which can be cut or merged to squeeze more resources for use elsewhere in the University. The push to spread diminishing resources as far as they will go will continue as the anthem for higher education in this decade as we all face shrinking budgets, increased costs and diminishing student enrollments.

During these times, we need mechanisms to help us record, measure and analyze our activities and provide access to information which is critical to our respective missions. The registrar needs to provide up to the minute enrollment information. The library needs to provide an effective on-line catalog and access to specialized databases. The financial management wing of the college or university must provide usable tools to let departments manage their resources effectively.

In all cases, we not only need to build better systems for independent areas, but also must construct systems that can assist us in furthering cooperation between the interdependent units of the university or college. Automated information systems which have historically been viewed as strictly administrative, are now of growing interest to academic units who are developing strategic and financial plans for the next decade. Many academic units are discovering "closets" of information and associated systems which have historically been isolated from all but those who directly maintained them. These discoveries are expanding the role and definition of what has been traditionally called Academic Information Systems.

In Indiana University's evolving Academic Information Systems (AIS) plan, an Academic Information System is defined as involving "the identification, delivery and interface between academic, administrative and institutional data and applications, both those which originate inside and outside Indiana University." The plan further stipulates that AIS should provide a way to interweave departmental, institutional and external information and resources in a coherent and easily used way. Academic Information Systems should not be restricted to a given computing hardware platform and should invite and enable collaborative efforts among the various information providers (the academic and administrative departments) and the service agencies (computing centers, telecommunications, etc.).

An Academic Information System should provide not only a vehicle to some other destination, but should be a destination itself. In the same way that a cafeteria offers both "a mechanism to access" a food item and the food item itself, an effective AIS should provide both process and content.

Traditionally, we have built elaborate menus on mainframe computers with logical tiers and hierarchies which must be navigated to gain access to the information or tool of choice. This approach lends itself to the novice user who might need extensive hand holding while they gain familiarity with the system, but over time becomes an impediment when the user wants to gain access to a function which lies five or ten layers deep in a series of menus.

In order to be truly effective, AIS access mechanisms need to be provided through the user's local desktop computer of choice. Users are likely to be more familiar and comfortable with this device than they are with the remote mainframe. We need to allow the user to tailor the service choices and access mechanisms to their own changing requirements rather than produce systems that are designed for anyone who might need access to anything.

Academic Information Systems: Defining the Needs of Academic Users

At one time, Academic Information Systems only provided a framework to gain access to basic tools such as electronic mail, bulletin boards, and textual data. Academic end users' needs greatly expanded beyond these boundaries, particularly with the advent of on-line library services and the desire to integrate these services with other remote systems and local data files. In addition, academic units now need to gain direct access to information about enrollments, student demographics, grant balances and departmental budgets, rather than solely depending upon other campus agencies to provide this information.

During the late 1980s, a variety of constituent groups at Indiana University began to articulate these needs in the form of specific proposals. For example, the Online Database Forum, made up of representatives from the libraries, computing centers and a variety of academic disciplines, has expressed the desire to support access to numerous local and remote specialized databases and indexes. And a committee made up of faculty, Registrar's Office staff, and University Computing staff developed plans for on-line access to class rosters.

Impediments to Addressing Academic Information System Needs

In the past, university information systems were primarily directed towards a given department or discipline. In most cases, these systems were designed to automate manual procedures and, as a result, did not lend themselves to a general audience. Even if a system was generally well developed for users who were external to a given department, there was still considerable difficulty in gaining access to the system if it resided on a different computer or network from the one the client was primarily using.

There were also differences arising from how administrative versus academic computing centers viewed the services that should be provided. The administrative computing approach assumed that the user needed a system to be designed and implemented to provide specific, pre-defined processing and static views of data files in a "cradle to grave" support structure. The academic computing approach urged the importance of user self-reliance with an emphasis on providing convenient access to tools and resources. While both of these approaches have merit, neither provided optimal service in isolation from the other.

At Indiana University, academic departments were similarly isolated from potential funding sources for systems which relied upon institutional data (traditionally kept on IBM mainframes). These funding sources were generally targeted at administrative systems. As a result, some of the expressed needs of the academic departments could not be accommodated without the direct involvement of a partner agency (such as the Registrar's Office) that did have access to the administrative system funding mechanisms.

Planning activities for computing at Indiana were also separated by the distinction between academic and administrative units. While a three year plan existed for Academic Information Systems in the academic computing environment, it concentrated on service delivery mechanisms and network dependencies. This plan did not address content issues, access to existing administrative information systems, or access to institutional data resources that existed on the administrative computing platform.

Academic Information System Islands

While segregation of information systems activities and resources characterized Indiana University's computing environment throughout the 1970s and most of the 1980s, certain attempts to bridge the gap were made during the latter part of this period. The Academic Information Environment (AIE) is the Bloomington campus-wide, VAX-based information system which has evolved into an effective information access vehicle. The AIE already incorporates a few of the aspects of an AIS as defined above. The services provided via the AIE range from access to electronic mail and bulletin boards to announcements from various student groups and information on class closings provided by the Registrar (some of these services

are described in detail below). In order to address the need to provide tailored access to services, the AIE lets the user define his/her own keywords which will bypass the menus and deliver the service of choice.

In anticipation of the on-line catalog, the University Libraries and the academic computing center developed the Library Information and Reference Network (LIRN). This is a subsystem of the AIE and provides a variety of services, including access to remote bibliographic databases, an electronic library reference desk, a way to renew library materials electronically, a mechanism by which library materials may be requested for delivery directly to a campus office, and access to the on-line catalog which is running on an IBM mainframe computer.

The University Service Environment (USE) is a state-wide service presentation similar in many respects to the AIE, but tailored to systems which reside on the IBM mainframe. While USE does not currently provide access to all IBM systems and services, it does enable the use of some systems which are of particular importance to academic constituent groups who have not had access to IBM systems in the past. It is accessible over the former academic network rather than through the traditional SNA network used by administrative computing client departments.

Administrative Systems: Moving Toward Integration

The 1970s and early 1980s were also a period of vigorous growth for administrative information systems at Indiana University. By the mid-1980s a large number of mature, integrated information systems were in place: student records, financial aid, student accounts, human resources, purchasing, and student advising, to mention only a few.

As alluded to above, most systems designed during this period had as their primary purpose the support of some operational or functional area of the university. Unlike systems of a decade earlier, however, the systems of this period accomplished more than the automation of a set of defined tasks. They were, in two important respects, *information* systems.

The systems were characterized by the creation and maintenance of large information repositories, providing a rich aggregation of information resources which were available to support the system itself and to support other management and analysis needs of the institution. These systems were also characterized by on-line data maintenance and on-line data access as their primary means of interaction with the user. The users of these on-line systems were, in most cases, information specialists -- either staff in the primary user office itself (the Registrar, the Bursar, etc.) or specially trained staff in one of the academic or academic-support units (professional advisors, academic deans, etc.). For these users at least, delivery of information had become an important system design criteria. These two factors -- the assembly of a rich information resource and the initial steps toward information delivery as an essential system feature -- provided the foundation for the changes in information systems the university has seen in the last five years.

An important stimulus for the change that occurred was the realization on the part of several administrative departments that they could, and probably should, expand the client base for their information delivery systems from a small number of information specialists to the entire university community of students, faculty and staff. The computer literacy movement of the mid-1980s and the grassfire of PC installations that spread across the campus (fanned by educational discounts and a university commitment to departmental computing and student computing) made this realization almost unavoidable. The result was a change in thinking, a paradigm shift from information systems for the "information elite" to information systems as a public service.

Administrative Systems: Early Efforts at Integration

Beginning in 1986-87, some early steps were taken by administrative units at Indiana University to provide true "public service" information systems to the university community at large. The first of these were simple information display systems, similar to public bulletin boards: Human Resources brought up a weekly Job Posting bulletin; the Registrar implemented a daily Closed Class Listing set of bulletins. In its earliest incarnation the Registrar's Class Listing system was implemented on a departmental PC, using a low-speed modem and public domain PC bulletin board software. Later, this and the Job Posting display were integrated into the VAX-based Academic Information Environment (AIE) described above.

Based on the success of these initial efforts and the positive response received from students and faculty, more ambitious plans for public service information systems were developed. Early in 1989, the Registrar implemented an Electronic Class Roster delivery system for faculty. For some time faculty had been taking paper rosters distributed by the Registrar and key-entering selected data from these into local databases on personal or departmental computers. This new system offered faculty the option of receiving class rosters electronically, delivered via the campus e-mail network. Rosters were delivered to faculty according to a pre-defined schedule: approximately once every two weeks during the semester. In its first semester, the system had 180 faculty users in 35 departments; in the second semester, the numbers were 250 users in 45 departments. A survey of faculty found the system had a 93% approval/acceptance rating. The system was enhanced in 1990 so that faculty users could request rosters from their workstation or terminal on an as-needed basis, rather receiving them on any fixed schedule.

Early in 1990, the academic advising units and the Registrar implemented a student-oriented presentation system for the university's on-line advising system. This system extended the capabilities of the DARS advising system (purchased from Miami University) by permitting each student the ability to access his/her own academic record and advising report from any terminal or workstation connected to the campus network, or from any personal computer equipped with a modem. Selection menus guide the student through the system, providing options to view the complete academic record, check progress toward a degree, experiment with alternate degree programs or the effects of possible future registrations, and update the Personal Identification Number which provides record-level security for each student's academic data. Similar efforts to these have also been made in the financial systems area, where expanded access has been offered to the on-line purchasing system and the on-line statement of account display system.

Administrative Systems: Discovering New Needs

These early experiences pointed up a number of differences between public service information systems and their more traditional counterparts. In the *design* of traditional information systems, the designer has the opportunity to meet face-to-face with the system users -- possibly a representative sample of management and front-line staff who will use the system or, in some cases, with the entire population of eventual users. Public service systems at a large university are designed, not for dozens or even hundreds of users, but any of several thousand potential users. And since use of a public service system is entirely a matter of choice for the user, finding a truly representative sample of users before the system is implemented is extremely difficult -- a situation which seriously hinders the traditional process of gathering user requirements.

A mature set of practices and procedures are in place for the *support* of traditional information systems -- user documentation, on-site user training, expert hot-line consulting, timely notice of system changes and upgrades, etc. -- all of these practices made possible because the information systems have a defined user-base that is known to the computing support organization. Again, with a large, and largely-anonymous, user population traditional support mechanisms need to be re-evaluated and re-tuned when applied to public service information systems.

As described above, traditional information systems are typically developed under the sponsorship of the department(s) who will be the system's users. Like most universities, Indiana University has a formal structure in place for the *proposal, review and funding* of systems development projects. While many public service information systems do have a natural sponsor (such as the Registrar for student systems), the traditional process of selecting and prioritizing information systems development cannot work as well when the real end users of the system have little or no voice in the funding process. In particular, because the user-base is so diverse and diffused, there is no focal point around which proposals for *new* public service information systems may be gathered; the end user public must rely on traditional IS user departments to propose or develop new systems and services.

Two other issues were brought into sharper focus through these early efforts. Traditional systems rely on a centrally-administered security process to control access; public service information systems need to find viable alternatives, such as student Personal Identification Numbers or some equivalent facility for faculty, so that security administration does not become a bottle-neck to information access. And second, the movement toward fully public information systems raises questions about the university's policies on access to institutional data; the need for formal policies and guidelines on data administration and access became apparent through this process, again so that over-protection of information does not become an obstacle to widespread access.

The process of identifying some of these emerging issues and working toward their solution was aided in great part by several user/technology organizations and advisory groups. The *Access to University Information Task Force*, made up of faculty and staff, focused its attention especially on the information needs of the academic community and made several recommendations regarding both the desired content of Academic Information Systems and the kinds of delivery mechanisms which should be employed. The highest priority content areas were student, course schedule, budget and account data; the desired delivery mechanisms were a combination of pre-defined or "canned" presentations and some measure of user-driven ad hoc access. A similar group was formed to provide guidance and advice specifically in the student systems area -- the *Registrar Advisory Subcommittee*, a faculty subcommittee of the Academic Computing Advisory Committee. This group was an effective design partner with the Registrar and Computing Services in the development of the Faculty Roster System.

Convergence: Organizational Factors

The convergence of academic and administrative interests which brought attention to bear on the concept of Academic Information Systems as a unique application area came from three sources: a University-level planning process, the restructuring of the University Computing organization and, most importantly, from the grassroots -- the academic and administrative constituents in the university community at large.

At the University-level, an academic strategic planning process directed by IU President Thomas Ehrlich resulted, in Spring 1988, in the publication of *IU: One University - Indiana at its Best*, a strategic plan and academic agenda for the entire institution. Building on this academic agenda, the Vice President for Administration and Finance began, also in 1988, an administrative planning process, one outcome of which was the publication of a *Statement of Administrative Philosophy* which begins with this common-sense, yet critically important statement:

> "All administrative activities are dedicated to serving and advancing the academic work of our students and faculty."

Although many administrative departments had long acted on this philosophy, it had not for several years been so unambiguously stated nor so universally applied. With this statement came a clear priority in the

information technology arena for focusing attention and resources on information systems for students, faculty, and academic staff -- in other words, a priority for Academic Information Systems.

During this same time period, a reorganization of computing was begun at Indiana University. A single computing organization was formed in 1989 from the merger of the university-wide administrative computing organization (Information Services) and the primarily campus-based academic computing organization (Bloomington Academic Computing Services). All units in this new organization, University Computing Services, serve both academic and administrative users. Within this merged academic/administrative computing organization there was formed an application development group with specific responsibility for Academic Information Systems (AIS) development. And while this group served as a focal point for AIS development, the AIS umbrella covers a much larger set of the computing organization's staff and resources. The technology units of networks, workstations, and central computing systems are providing the infrastructure on which Academic Information Systems can be built. The systems development unit, especially the AIS development team, in partnership with the data administration and access group, is working with several user departments to extend the reach of Academic Information Systems.

As important as these top-down organizational factors may have been, the undeniable momentum for Academic Information Systems came from the grassroots. The un-met information needs of the students, faculty and academic staff assured that, under almost any set of organizational circumstances, progress would be made on delivering a new style of information system to meet these needs. The early AIS initiatives (the on-line library catalog, AIE, etc.) and the early administrative system initiatives (the on-line class listings, faculty rosters, etc.) -- and the success of these early efforts -- all but guaranteed that attention and resources would continue to be focused on the delivery of this type of system.

Convergence: Technology Factors and Computing Priorities

Technology factors are closely interrelated with organizational factors in providing the impetus for Academic Information Systems. The convergence of academic and administrative initiatives in turn has provided direction to the University Computing organization in setting its technology priorities.

Among its highest technology priorities, University Computing Services has placed significant emphasis on the installation and operation of a campus-wide and state-wide high-speed network based on the TCP/IP protocol. Although it is not yet ready to fully replace the other networks which had been in place (including SNA for state-wide administrative use and DCA for state-wide asynchronous terminal connections), the TCP/IP network is the backbone on which information delivery to the desktop of students, faculty and staff is being built.

Also among its highest priorities, University Computing Services has envisioned a world which places the user at the center of a rich information and computing environment, and which delivers seamless access to this environment via the workstation. Although many steps are necessary to achieve this vision, its practical realization in the near term will be an extension of the AIS information delivery model to the workstations and personal computers of students, faculty and staff.

Finally, University Computing Services, in partnership with several of its key clients, has adopted a philosophy of information management that says that the value of information as an institutional resource is *increased* through its widespread and appropriate use. The delivery of institutional information through various Academic Information Systems is consistent with this belief; public service information systems which serve thousands or users, rather than tens or hundreds, have the capability of adding significantly more value to the institution through their widespread dissemination of useful information.

The Joint Academic Information Systems Subcommittee

In order to address the needs and take advantage of the converging organizational and technology factors, and the evolving computing priorities identified above, Indiana University has initiated an end user process for planning the future of Academic Information Systems. This process began in concept almost one year ago with the formation of an Academic Information Systems Subcommittee that is a joint undertaking between the University's academic and administrative computing advisory committees. Before describing this subcommittee and its role, some background on these advisory committees should prove useful.

An advisory committee for academic computing at Indiana has been in existence for at least 15 years, and an administrative computing advisory committee was created in late summer of 1989 as a result of the merger of the administrative and academic computing organizations. The committees are responsible for providing advice to both the University administration and to University Computing Services on user needs, policy directions, planning, and prioritization of budget initiatives. They also function to oversee the activities of University Computing. The Academic Computing Policy Committee is comprised of faculty and students, whereas the Administrative Computing Advisory Committee is comprised of administrators, academic staff, and faculty.

The appointment of the joint Academic Information Systems Subcommittee evolved from a set of advisory committee and UCS staff discussions which took place during the 1989-90 academic year. These discussions were initiated in response to the unmet needs and driving forces that have been identified above. Through these discussions, it was recognized that the concept of an AIS, while quite nebulous, needed to span the traditional distinctions between academic and administrative computing. As a result, both advisory committees agreed to form the joint AIS Subcommittee. One interesting aspect of this subcommittee is that it is the first formal coupling of administrative and academic computing from the end users' perspective. The initial charge for the AIS Subcommittee is to prioritize the development of new projects for IU-Bloomington's Academic Information Environment (AIE), establish standards for the presentation of information within this and other such environments, and develop long-range and annual implementation plans for the AIS area.

The membership of the AIS Subcommittee also helps to reveal its nature. This membership includes high-level administrators, a number of faculty, and a student advisor. The importance of the subcommittee's responsibilities is reflected in the fact that two assistant vice-presidents volunteered as members. (However, it is only fair to note that these administrators have yet to attend any of the committee's meetings.)

The Planning Process and the Academic Information Systems Plan

The long-range planning responsibility of the AIS Subcommittee evolved from a primary goal of both the academic and administrative advisory committees. These committees have recently been charged with the task of developing new long-range (five year) plans for computing at Indiana, with the major emphasis on delineating broad goals and specific objectives. This is being done in cooperation with University Computing Services' staff, who are providing assistance with the evaluation of future technologies in this context. Academic Information Systems is one of the five planning areas for academic computing, and will be one of a similar set of planning areas for administrative computing.

As a joint undertaking, the AIS Subcommittee has been asked to prepare a plan that addresses both academic and administrative computing needs. Since the AIS plan is intended to be part of the larger planning documents (one focused on academic computing and one focused on administrative computing), the subcommittee has been given only two and a half to three months to develop the plan. Another two months will be required to integrate it with the other planning elements to form the overall planning documents. The components of the plan are also prespecified by the larger advisory committees, and include a vision statement, an environmental analysis, specification of general goals, and a measurable set of objectives.

The AIS planning process is now nearing completion, with the final draft of the plan expected within the next two weeks. But enough progress has been made to provide a good bit of detail on the plan itself, and on how it will be implemented. Perhaps the most important component of the plan is *the vision statement*, which provides the definition of the AIS concept described above, and ties this abstract concept to some specific examples. Two excerpts from the vision statement are particularly useful in making that definition more concrete, and in illustrating how the needs we have identified have been translated into the document.

> "AIS should extend the boundaries of the University by facilitating a greater sharing of academic and administrative information across all computing platforms..., and be based on a cooperative relationship among the research, instructional, library, computing and administrative communities."

> "The systems must provide reliable, efficient, and accurate transmission of information from its repository to the desktops of all students, faculty, and staff."

In addition, several very useful examples are provided in the vision statement. These examples are of integrated access to multimedia data for music scores using hyper-media tools; network access to 1990 US Census data residing on the University Library's CD ROM; and integrated, easy access to registration, course, and financial aid information systems for students. An excerpt from the vision statement describes the last of these examples in an especially revealing way. It describes the system as one:

> "...which would allow the student to answer such questions as: What courses can I take to meet my degree requirements? When are these courses offered and are they open? Who is teaching the course? Can I see last year's evaluations of the course or instructor? Can I see the course description and syllabus? Okay, can I register? Great, how much do I owe? (Holy cow!!!) Does my financial aid cover it?"

The vision statement of the AIS plan also identifies the characteristics of the information delivery system to be developed at Indiana University. Specifically, this information delivery system should encourage use by the novice as well as the expert, provide standard tools for data display and manipulation, operate or be accessible at the workstation level, allow for customization by each user, and be deliverable over the network. These characteristics represent a direct response to the need for an integrated, easy to use, information delivery environment that was identified above.

The second component of the plan, *the environmental analysis*, is intended to identify the nature of the existing AIS environment at Indiana University and elsewhere, thus providing the baseline to evaluate what is needed to achieve the vision. The environmental analysis is divided into two components -- one focused on the internal environment and one focused on the external environment. Key conclusions from the internal environmental analysis are that Indiana does have some basic information access mechanisms in place (as identified above) along with the network infrastructure to deliver these mechanisms to the workstation. Although workstation-based tools that can be used to manipulate multi-media data are not yet available, the resources to develop these tools are present in the form of a workstations division in University Computing Services. Comparing Indiana University's AIS efforts to those of other major universities, it is apparent that AIS is a relatively new area for most institutions. While fledgling efforts such as IU's AIE do exist on many campuses, no mature implementations of AIS as defined and described by the planning effort have yet evolved. However, a great deal of interest in this topic is evident across the country, judging especially from the amount of Bitnet and Listserv message traffic discussing related issues.

Five *general goals* have evolved from the planning process. These are also directly traceable to the unmet needs detailed in the preceding sections, and the AIS Subcommittee feels that the goals encompass all of the major areas of effort required to address the unmet needs. The five goals are:

- Provide integrated access to multimedia (image, sound, and text) data.
- Provide integrated access to campus and external databases that support the needs of the University community.
- Provide access to software tools that facilitate organizing, filtering, and presenting AIS data.
- Provide access to the technology and infrastructure that facilitate organizing, filtering, and presenting AIS data.
- Provide documentation (on-line & paper), education, and support for the AIS environment.

Implementation

Even though the Subcommittee is currently in the process of preparing two or three measurable objectives for each of the goals, the implementation mechanisms are already in place to move ahead with the plan as soon as it is complete. First, the AIS component will be incorporated into the integrated plans for both administrative and academic computing. This will be followed by distributing the resulting planning documents to the Indiana University community via a system-wide newspaper that reaches every faculty and staff member in the eight campus system. The AIS recommendations will then be forwarded to several other University planning committees to assure consistency. One such committee is a Bloomington campus committee charged with planning the coordination of computing, library, audio-visual, and communications resources to enable the delivery of multimedia data and information.

There are four principle implementation mechanisms for these advisory committee planning efforts. The first of these are the annual implementation plans for "application areas." Application areas serve as the focus for University Computing to acquire and support end user computing tools and ways to employ those tools. Each application area plan includes a budget and a task/project list for the coming fiscal year. The objectives generated by the AIS Subcommittee will serve as the focus of the AIS application area implementation plan. Other relevant application area plans that will be affected by the long-range AIS plan recommendations include computer technology in education, network applications, graphics, database, and emerging technologies.

The second implementation mechanism is the process by which University Computing Services budget priorities are established each year. This process represents a combination of University Computing staff, senior management, and advisory committee recommendations. The AIS plan objectives will have a major impact on the establishment of these budget priorities. Even when new funding from the University administration is not forthcoming to support a high priority project, reallocation of University Computing Services' base budget generally takes place to ensure progress on these high priority projects and objectives.

The third implementation mechanism is the 1.1 million dollar systems development fund that was identified above, and is used by the University to subsidize these development projects. This fund is allocated to projects on a competitive basis by a subcommittee of the Administrative Computing Advisory Committee. Not only are four of the twelve members of this systems development subcommittee also members of the AIS Subcommittee, but the focus of AIS corresponds with one of the University's systems development priorities -- namely that of establishing systems that directly meet the needs of faculty, students, and academic staff. It is almost a certainty that several systems development project proposals will be derived from the AIS Subcommittee planning objectives. The probability that some or all of these will be subsidized by the University's systems development fund is very high.

The final implementation mechanism is the day-to-day activities of the AIS Subcommittee itself. Not only is this subcommittee charged with long-range and implementation planning responsibilities, but it is also responsible for recommendations as to the function, design, and content of the current information delivery environment available on the central academic computing systems (the AIE) and the administrative mainframe (USE).

Together, this set of implementation mechanisms should provide the University, University Computing Services, and the AIS Subcommittee with sufficient opportunities for making the AIS vision a reality. This is true even in an era of cost containment.

Conclusions

There are six major conclusions we are able to draw from Indiana University's experience with AIS planning. The first is that we have been able to identify a working definition and concept of "Academic Information Systems" that can be jointly agreed on by faculty, administrators, and academic staff. This concept also includes guidelines for an effective information delivery system. The concept of AIS as defined here is one that is very useful for delineating the scope of AIS activities, and is applicable to any other university or college environment.

Second, there are no mature implementations of the AIS concept, at least as we have defined it. At the same time, our external analysis revealed that this is a topic of great interest at many institutions, and that a number of institutions such as Indiana are ready to move ahead in this area with great enthusiasm.

Third, the role of advisory committees in establishing AIS needs, directions, and implementation is almost indispensable. If it was not for the computing advisory groups at Indiana University and their willingness to work together to establish the AIS concept, we would still be planning for separate information delivery mechanisms that did not effectively meet the University's needs. Indeed, even though computing center staffs worked on AIS issues for several years prior to the involvement of our advisory committees, the staff just could not come to an effective closure on what AIS was, much less how to plan and manage the AIS environment. Again, this is a conclusion we feel is applicable to almost any institution.

Fourth, it should be apparent that there has been an evolution of forces leading up to the identification and delivery of effective AIS services. Not only are the technologies required for multimedia data transfer currently emerging in forms that can be tailored to the requirements of an effective AIS environment, but the needs of our universities and colleges have evolved to the point where delivery of this type of information is essential. The growing competition among institutions for students, research dollars, and qualified faculty and staff makes an effective information management and delivery environment a strategic tool.

Fifth, Indiana University's experience confirms that productive planning and implementation for AIS are possible. We feel this is apparent in this paper even though Indiana is only now nearing the end of the AIS planning effort.

Finally, and perhaps most importantly, Indiana's experience can be readily generalized to other institutions of higher education. We do feel it is important to note that while the merger of administrative and academic computing at Indiana certainly helped to ease the communication process between the administrative and academic community, this was not a critical factor in the evolution of AIS planning. As should be evident in the other sections of this paper, all of the technologies, computing priorities, and needs we have identified were already evolving towards making the Academic Information Systems concept a reality at Indiana University. This evolution was independent of the merger of our former administrative and academic computing organizations.

A COLLEGE POLICY ON COPYRIGHTED MATERIAL[1]

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Management and control of intellectual property have become a prime concern of IS management. In many institutions, information service centers include administrative, academic and library information systems. Intellectual property in these centers may be in the form of electronic data, magnetic and laser disks, magnetic tapes, microfilm, and printed material. They include such information as computer data and programs, music, plays, recordings, and books. Guidelines must be established based on copyright law for the appropriate use of intellectual material in our educational environment. We have developed a "working copy" of a comprehensive copyright policy that we are implementing at Winthrop.

[1] A full-length "working copy" of Winthrop College's copyright policy can be made available by contacting Bill Moressi or Betty Laster in the Division of Information Management at Winthrop College.

WHAT IS A COPYRIGHT?

Copyright is a method that governments use to promote innovation and publication. It is essentially a monopoly given to the creator of an original work for a limited time. By preventing anyone but the creator or author from profiting from the production of a copyrighted work, an incentive to produce such works exists. Our founding fathers considered Copyright so important that they included it in the U.S. Constitution (Art.I, Sec.8).

Copyright covers the expression of ideas, not the idea itself. An idea that results in a useful physical object may be eligible for another type of government protection, the patent. Thus a book about programming may be copyrighted, but the basic principles of how to program may not. Works of authorship include literary works (books and printed material); computer program (software); musical works, including lyrics; video productions (motion pictures, videotapes); sound recordings; and dramatic works.

Congress has tried to balance the right to exclusive benefit of authorship with the public interest by passing copyright laws. The current law was passed in 1976. Besides setting out penalties for violation of copyright, the law also defines situations when copyrighted materials may be used by the public, the so-called "fair use" doctrine.

Notwithstanding the provisions of the Copyright Law (17 U.S.C. §106), the fair use of the copyrighted work, including such use by reproduction in copies or phonorecords for purposes such as criticism, comment, news reporting, **teaching (including multiple copies for classroom use), scholarship, or research,** is not an infringement of copyright. Factors to be considered in fair use are:

1. the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes. Reproduction for commercial purposes is prohibited.

2. the nature of the copyrighted work.

3. the amount and substantiality of the portion used in relation to the work as a whole.

4. the effect of the use upon the potential market for or value of the copyrighted work.

POLICIES AND PROCEDURES

Literary works: Books and other printed materials.

As employees of colleges and universities, we are all aware that our students and faculty use copyrighted materials every day. Certain guidelines in the copyright law and in agreements included in the congressional deliberations leading up to the law provide the legal rationale for our use of these literary works.

Literary works are works expressed in words, numbers, or other symbols manifested in books, manuscripts, cards, or other printed materials. Photocopying of books and other printed material is one of the most troublesome practices facing college faculty. The fair use doctrine allows copying of copyrighted works for teaching, scholarship and research. It does not allow, however, wholesale copying without limit. The basic principle a potential copier should consider is, "Is my copying adversely affecting the possible sale of this work by the copyright holder."

The educational community and publishers have agreed upon specific guidelines to help answer this basic question. Winthrop College has adopted the "Model Policy Concerning College and University Photocopying for Classroom, Research, and Library Reserve Use" of the American Library Association as our policy on printed materials. The following example is a case referencing the above fair use question. An instructor may copy an article to hand out in class or put on reserve in the library, if the decision to copy was "spontaneous". A "spontaneous" circumstance would be one where the instructor did not have time to get permission from the publisher. In this case, the instructor should not copy the same article next semester without prior permission from the copyright holder. The instructor has had a whole semester to ask for permission.

Similar guidelines, a single chapter from a book, a single short story, a picture, etc., have been developed for other types of publications. The basic principle applied is that the copy should not be most of the total work.

Copyright law specifically prohibits certain copying. Instructors may not create anthologies by copying many articles and using them together as a basic text for a course. Teachers may not charge students more than the actual cost of the copies. Consumable works, such as tests, may not be copied.

Penalties for copyright infringement include assessment of actual damages to the copyright holder. Statutory damages can go as high as $50,000. Edûcators are exempted from statutory damages if the copying was believed to be fair use.

Computer Programs

Computer programs are sets of statements or instructions to be used directly or indirectly in a computer to cause a certain result. The rapid emergence and widespread use of computer programs (software) on microcomputers and in local- and wide-area networks raise difficult questions concerning copyright laws.

At the core of our policy at Winthrop is recognition that the copyright law protects all software against copying and distribution even without a license agreement. The **only** exception is public domain software. The policy applies to faculty, staff and students, alike. It includes all application and operating system software used in centralized systems as well as software used on microcomputers.

We categorize the software as purchased, leased, evaluation/demonstration, and public domain. We define non-permissible and permissible use based on the U. S. Copyright Law. Generally, the law prohibits copying for the purposes of distribution either for resale or for sharing.

Specifically, purchased software cannot be copied for simultaneous use on a second computer.

The policy for leased software differs based on whether it is a single copy, a site license, or a network version. Software obtained through a single copy lease is to be treated as purchased and is subject to the same law governing purchased software. Where a site license has been purchased, one is permitted only one serialized copy for use on one microcomputer. When the leased software is used in a network environment, only an archive copy may be made. The number of archived copies will depend on the network's recovery policy. Except for networked versions, the software can be copied for archive purposes or to ease its use, for example, copying to a hard disk for processing.

Evaluation or demonstration software is requested, ordered, and controlled through our College's Library. Copying of this software is considered illegal or unethical without the written consent of the owner.

One is expected to pay a license fee for shareware used when requested by the copyright holder. Public domain software is declared as such and is available for use by all. It is therefore exempt from the copyright law.

Musical Works, including lyrics

Musical works are works that include any accompanying words and are fixed in some tangible medium of expression. Musical works include both original compositions and original arrangements. Copying of music may be undertaken for legitimate educational purposes. We attempted to cover the minimum standards of educational fair use under Section 107 of the Copyright Law. Also, we develop our policy with the understanding that future revisions will be necessary as we adapt to changes of the copyright law defining fair use.

Non-permissible copying would include copying to create or replace or substitute for anthologies, compilations or collective works. Copying whole or parts of works intended to be "consumable" in the course of study or teaching, such as work books and exercises, is not allowed under copyright law. The law prohibits copying for performance, copying as a purchase avoidance, and copying without inclusion of the copyright notice.

The following statements of permissible copying provide only minimum examples of fair use. There may be instances in which copying is permitted under the criteria of fair use, but does not fall under any of these stated conditions.

One may duplicate purchased copies that are not available for an imminent performance provided new purchased copies be substituted directly.

For academic purposes it is permissible to make single or multiple copies of excerpts of works if such excerpts are not performable as a section, movement, or aria. The excerpt may not make up more than 10% of the whole work. Copies of excerpts are limited to one per pupil.

For academic purposes other than performance, it is permissible to make a single copy of an entire performable unit, such as a section movement or aria. The instructor must confirm from the copyright proprietor that the unit is out of print or unavailable except in a larger work. One may use such a copy only for scholarly research or preparation for teaching a class.

Purchased printed copies may be edited or simplified as long as one preserves the fundamental character of the work. In such case, lyrics, if they exist, cannot be altered. Lyrics may be added if they are not present in the work.

A single copy of recordings of performances by students may be made for evaluation or rehearsal purposes and may be retained by Winthrop College or the individual teacher.

Also, a single copy of a copyrighted sound recording owned by the College may be made when the purpose is to construct aural exercises or examinations. This copy can be retained by the individual teacher. This rule pertains to the copyrighted music only and does not include other copyrighted material that may be a part of the recording.

Video productions: motion pictures, videotapes

Our focus here is on broadcast programs. *Broadcast programs* are television or radio programs transmitted by television or radio stations for reception by the public without charge. The following guidelines reflect a national committee's consensus on the application of fair use to the recording, retention and use of television broadcast programs for educational purposes. The committee, appointed by Congress in 1979, represented 19 organizations of publishers, librarians, media producers, educators, broadcasters, writers, and others. The following information reflects some views expressed by the committee.

A broadcast program may be recorded off-air simultaneously with broadcast transmission (including simultaneous cable transmission) and retained by Winthrop College for a period not to exceed the first forty-five (45) consecutive calendar days after date of recording. Upon conclusion of such retention period, all off-air recordings must be erased or destroyed immediately.

Off-air recordings may be made only at the request of and use by individual teachers. One may not be regularly record them in anticipation of requests. No broadcast programs may be recorded off-air more than once at the request of the same teacher, regardless of the number of times the program may be broadcast.

An instructor may not use off-air recordings in the recording institution for student exhibition or any other non teaching or teacher evaluation purposes. One may not alter recordings from their original content, that is, they may not be physically or electronically combined or merged to constitute teaching anthologies or compilations.

Off-air recordings may be used once by individual teachers during relevant teaching activities. They may be repeated once only when instructional reinforcement is necessary, in classrooms and similar places devoted to instruction within a single building, cluster or campus, also in the homes of students receiving formalized home instruction. This must take place during the first ten (10) consecutive school days in the forty-five (45) day calendar day retention period. "School days" are school session days, not counting weekends, holidays, vacations, examination periods, or other scheduled interruptions, within the forty-five calendar day retention period.

Teachers may reproduce several copies from each off-air recording to meet the legitimate needs under the following guidelines. Each such additional copy shall be subject to all provisions governing the original recording. After the first ten (10) consecutive school days, off-air recordings may be used up to the end of the forty-five (45) calendar day retention period only for evaluation purposes. Such an evaluation may be to decide whether to include the broadcast program in the instructional curriculum.

In cases in which Winthrop College enters into a formal licensing agreement with the holder of a copyright of an audio or video production, the provisions of the license shall govern the conditions of copying and use of such productions.

Sound recordings

A *sound recording* is a work that may be fixed on a physical medium such as a phonorecord. The phonorecord may be a tape, cassette tape, cartridge or disk. In this section, reference to a phonorecord will be about that device upon which a sound recording is fixed.

The owner of a copyright of a phonorecord has the exclusive rights to distribute copies of the phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending (17 U.S.C. § 106(3).)

The owner, by purchase or transfer of ownership, of a particular phonorecord obtained under section 106(3) may, without the authority of the copyright holder, sell or otherwise dispose of that phonorecord. The owner, however, may not dispose of directly or indirectly the phonorecord sound recording for purposes of commercial advantage by rental, lease, or lending. Nothing in the preceding sentence shall apply to the rental, lease, or lending of a phonorecord for nonprofit purposes by a nonprofit library or nonprofit educational institution (17 U.S.C. § 109(b)(1).)

Dramatic works: plays

Dramatic works include plays, pantomimes, and choreography prepared for stage presentation and scripts prepared for cinema, radio, and television. Copying of dramatic works may be undertaken for legitimate educational purposes. The following statement of guidelines is not intended to limit the types of copying permitted under the standards of fair use under judicial decision that are stated in section 107 of the Copyright Revision Bill. There may be instances in which copying that does not fall within the guidelines stated below may, nonetheless, be permitted under the criteria of fair use.

One may make copies under "emergency" conditions to replace purchased copies that are not available for an imminent performance. Purchased replacement copies shall be substituted directly.

For academic purposes other than performance, single or multiple copies of excerpts of works may be made. The excerpts must not comprise a part of the whole that would constitute a performable unit such as an act or scene and never more than 10% of the whole work. The number of copies shall not exceed one per pupil. A teacher may make a copy of an entire performable unit for research or teaching purposes if the unit is confirmed by the copyright proprietor to be out of print or that it is unavailable except in a larger work.

A purchased, printed copy may be edited if the teacher does not distort the fundamental character of the work. A single copy of recordings of performances by students may be made for evaluation or rehearsal purposes. The College or the individual teacher may retain a copy.

One may make a single copy of a sound recording (such as a tape, disc or cassette) of copyrighted dramatic works from sound recordings owned by Winthrop College or an individual teacher for constructing aural exercises or examinations. This pertains only to the copyright of the dramatic work itself and not to any copyright that may exist in the sound recording.

Copyright law in the educational environment does not permit copying to create, replace or substitute for anthologies, compilations or collective works. One may not copy dramatic works intended to be "consumable" during study or instruction such as workbooks, exercises, standardized tests and answer sheets and like material. Should a copyright notice exist on the printed material, it must be included on all copies.

ADMINISTRATION

Policy development and communication

Administration of the copyright policy includes communication, implementation, evaluation, and revision of the policy as needed. It will be the responsibility of the Computer Utilization Committee to develop supporting materials to help in communicating the policy to the faculty, staff, and students of Winthrop College.

The Executive Director of Information Management, working under the direction of the V.P. of Academic Affairs, will be responsible for distributing supporting materials to the college community on copyright policy. The Executive Director also will provide for seminars to the college community on copyright policy. Finally, the Executive Director will record valuative feedback of the effectiveness of the policy. Feedback will be channeled through the Administration to the Computer Utilization Committee for review and possible recommended revision.

TABLE I
Recommended procedures for dealing with probable policy violations.[2]

ACTION	FACULTY	STAFF	STUDENTS
Allegation	In writing	In writing	In writing
Investigation	Executive Director of Information Management	Executive Director of Information Management	Executive Director of Information Management
Disciplinary Action	Dean of Academic Unit and Senior Vice President for Academic Affairs according to "Termination Procedures" in Faculty Manual	Department Head Area Vice President and Vice President for Academic Affairs according to "Guidelines for Disciplinary Action"	Associate Dean for Student Development and Senior Vice President for Academic Affairs according to the Student Conduct Code's "Disciplinary Process"
Appeal	Policy and Procedures for Employee Grievances and Appeals	Policy and Procedures for Employee Grievances and Appeals	Student Conduct Code's "Disciplinary Process"

[2] These procedures are currently under review by the President's Office and Faculty Concerns committee.

Infringement

Table 1 outlines recommended procedures for handling probable copyright policy violations. Alleged violation of this policy will be investigated by the Executive Director of Information Management. Disciplinary steps will be taken against individuals violating copyright policy during College-related activities or individuals using College resources to conduct or assist in unlawful copying. Appropriate action will be taken for faculty, staff, or students according to procedures outlined in Winthrop College's College Faculty Manual, Guidelines for Disciplinary Action, and Student Handbook, respectively. Possible disciplinary actions will depend on the facts and circumstances of each case and most likely will include restitution to the copyright owner. Also, individuals may be denied access to the College's facilities. Severe and blatant violation of copyright can result in termination of employee or student status.

Bibliography

1. U.S. Copyright Law. Title 17 of the United States Code (revised to March 1, 1989). Circular 92. Washington, D.C.: Government Printing Office, 1989.

2. U.S. Copyright office. Library of Congress. Circular 1, Copyright Basics. Washington, D.C.: Government Printing Office, 1988.

3. U.S. Copyright office. Library of Congress. Circular 2, Publications on Copyright. Washington, D.C.: Government Printing Office, 1988.

4. U.S. Copyright office. Library of Congress. Circular 7d, Mandatory Deposit of Copies or Phonorecords for the Library of Congress. Washington, D.C.: Government Printing Office, 1989.

5. U.S. Copyright office. Library of Congress. Circular 21, Reproduction of Copyrighted works by Educators and Librarians. Washington, D.C.: Government Printing Office, 1988.

6. U.S. Copyright office. Library of Congress. Circular 22, How to Investigate the Copyright Status of a Work. Washington, D.C.: Government Printing Office, 1989.

7. U.S. Copyright office. Library of Congress. Circular 40, Copyright Registration for Works of the Visual Arts. Washington, D.C.: Government Printing Office, 1989.

8. U.S. Copyright office. Library of Congress. Circular 40D, Copyright for Audiovisual Material. Washington, D.C.: Government Printing Office, 1974.

9. U.S. Copyright office. Library of Congress. Circular 49, Copyright for Audiovisual Material. Washington, D.C.: Government Printing Office, 1977.

10. U.S. Copyright office. Library of Congress. Circular 50, Copyright Registration for Musical Compositions. Washington, D.C.: Government Printing Office, 1989.

11. U.S. Copyright office. Library of Congress. Circular 56a, Copyright Registration of Musical Compositions and Sound Recordings. Washington, D.C.: Government Printing Office, 1989.

12. U.S. Copyright office. Library of Congress. Circular 60, Copyright for Books. Washington, D.C.: Government Printing Office, 1977.

13. U.S. Copyright office. Library of Congress. Circular 61, Copyright Registration for Computer Programs. Washington, D.C.: Government Printing Office, 1989.

14. U.S. Copyright office. Library of Congress. Circular 67, Poems and Song Lyrics. Washington, D.C.: Government Printing Office, 1977.

15. U.S. Copyright office. Library of Congress. Circular 96, sections: 202.19, 202.20, and 202.21. Washington, D.C.: Government Printing Office, 1989.

16. U.S. Copyright office. Library of Congress. Circular R15, Extension of Copyright Terms. Washington, D.C.: Government Printing Office, 1983.

17. U.S. Copyright office. Library of Congress. Circular R45, Copyright Registration for Motion Pictures Including Video Recordings. Washington, D.C.: Government Printing Office, 1980.

18. U.S. Copyright office. Library of Congress. Circular R49, Copyright Registration for Video Games and other Machine Readable Audiovisual Works. Washington, D.C.: Government Printing Office, 1985.

19. U.S. Copyright office. Library of Congress. Circular R99, Highlights of the Current Copyright Law. Washington, D.C.: Government Printing Office, 1985.

20. U.S. Copyright office. Library of Congress. Circular R96, section 201.18. Washington, D.C.: Government Printing Office, 1985.

21. U.S. Copyright office. Library of Congress. Circular R96, section 201.18. Washington, D.C.: Government Printing Office, 1984.

22. U.S. Copyright office. Library of Congress. Circular R96, section 202.10. Washington, D.C.: Government Printing Office, 1985.

23. U.S. Copyright office. Library of Congress. Circular R96, section 202.1. Washington, D.C.: Government Printing Office, 1984.

24. Hutching, Mary. "Model Policy Concerning College and University Photocopying for Classroom, Research, and Library Reserve Use," College and Research Libraries News, April 1982, pp 127-131.

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